REMARKS

Claims 1- 7 and 17-20 are all the claims pending in the application. Applicant has added new claims 17-20 to more particularly define the invention. Applicant has cancelled claims 8-16 without prejudice or disclaimer consistent with the restriction requirement.

Second, Applicant respectfully traverses the decision to treat Applicant's election of species with traverse as "an election without traverse." Indeed, Applicant seeks the Examiner's re-consideration of this decision. Applicant asserts that the Response to the Restriction and Election of Species Requirement of January 17, 2006, distinctly and specifically met the threshold for providing reasonable assertions in pointing out the supposed errors in the election of species requirement as required by the MPEP. To be sure, and for emphasis, the Response emphasized the similarities between the metals with regard to their placement within the Periodic Chart. (See Response, Page 2). Accordingly, Applicant has met the required burden. Even if the Examiner does not agree with the assertions made by Applicant, the Examiner should, at least, make the "election with traverse" final not "an election without traverse." Please note, Applicant is aware of its rights to petition such a decision but would prefer to resolve this issue in the context of this amendment and focus on the more substantive aspects of the prosecution of the above Application.

Finally, Claims 1-7 stand rejected on prior art grounds. Applicants respectfully traverse the prior art rejections based on the following discussion.

I. The Prior Art Rejections

Claims 1-7 are rejected under 35 U.S.C. Section 102(e) as being anticipated by Tapphorn, et al. ("Tapphorn")(U.S. Patent No. 6,915,964). Claims 6 and 7 are rejected under 35 U.S.C. Section 103(a) as being unpatentable over Tapphorn as applied to claim 1 above, and further in view of Garvick, et al. ("Garvick")(U.S. Patent No. 6,173,650).

A. The Rejection Based on Tapphorn

Regarding claims 1-5, Tapphorn fails to disclose, teach or suggest the features of independent claim 1, and related dependent claims 2-5, including depositing a metal layer of a cation in situ on the substrate layer. (See Page 4, lines 13-27; Page 8, lines 4-11; and Figures 1A-1C).

Indeed, Figures 1-16 of Tapphorn merely teach a conventional system for solid-state deposition and consolidation of high velocity powder particles onto a surface of an object using a subsonic or sonic gas jet. Thermal-plastic conditioning or heating of powder particles and substrate is performed to reduce the yield strength during impact, and thus permit plastic deformation at low flow stress levels. Applicant respectfully submits that the Office Action mischaracterizes the Tapphorn invention as forming a substrate layer and in situ deposition of a metal layer on the substrate layer along with reactive materials to create an explosive mixture. (See Tapphorn at Abstract; Column 1, lines 15-42; Column 4, lines 54-63; Column 6, lines 45-57; and Office Action, Page 2, Section 3).

Indeed, Tapphorn only discloses, in pertinent part, injecting into a metallic matrix a pyrophoric material for controlling the pyrophoric reactivity, temperature and spectral emission of a pyrophoric flare. Similarly, Tapphorn discloses, injection reactive metallic

or nonmetallic materials into pores of a metal matrix consolidation to create an explosive mixture when heated to a threshold temperature. Importantly, these process steps involve injecting either a pyrophoric material or reactive metallic or nonmetallic material into pores of a metal matrix and heating to a threshold temperature to create an explosive mixture, whereas Applicant (as discussed below) discloses depositing a metal layer of a cation in situ on the substrate layer and further reacting the metal layer of a cation with a gas or liquid phase reactant to form a primary explosive layer (not what the Examiner analogizes in Tapphorn to an unstable explosive mixture ready to explode upon heating) (See Tapphorn, Column 13, lines 26-40).

Further, please note, that Tapphorn also discloses depositing a titanium powder as a coating on a substrate surface sealed with an epoxy for providing a corrosion resistant coating on reactive metal surfaces, that is, presumably the titanium powder. Accordingly, this embodiment is primarily focused on forming a corrosion resistant coating on metal, not a metal layer of a cation on a substrate layer where the metal layer of the cation is reacted with a gas or liquid phase reaction to form a primary explosive layer as taught by Applicant (See below). Please note, this embodiment discloses the use of titanium powder not a cation like Applicant. Further, please note, Tapphorn does not appear to disclose or suggest that the deposition, in the above embodiment, is performed in-situ, particularly, as Tapphorn appears to use sub-sonic or sonic jets. Therefore, Tapphorn does not disclose, teach or suggest including depositing a metal layer of a cation in situ on the substrate layer. (See above).

In contrast, as indicated above, Applicant discloses a method of making a thin film explosive detonator, which removes the necessity for synthesis, handling, loading,

transportation and storage of bulk quantities of sensitive primary explosive materials as extremely small quantities of explosive are needed as the explosive function is directly formed within the MEMs device. (See Application, Page 4, lines 5-30).

In particular, Applicant discloses an exemplary embodiment of a process where a substrate 10 is formed. A metal substrate 12 of an explosive cation is deposited in situ on the subtrate 10. The metal substrate 12 is reacted with either a gas or liquid phase reactant to form a primary explosive layer 14, such as, copper azide. An organic flyer plate 16 may be deposited on top of the explosive layer 14. Please note, the metal substrate of an explosive cation 12 may include, for example, copper, nickel, cadmium or silver. (See Page 4, lines 5-30; and Figures 1A-1C).

In contrast, Tapphorn does <u>not</u> disclose or suggest, as indicated above, depositing a metal subtrate of a cation in-situ on a substrate, <u>let alone</u>, reacting the cation with a gas or liquid phase reactant to form a primary explosive layer. Therefore, Tapphorn only discloses or teaches either injecting a pyrophoric material, a reactive metallic or non-metallic material into a metal matrix <u>or</u> depositing a titanium powder on a substrate and sealing with an epoxy to form a protective coating of the reactive metal surface, that is, the titanium powder. Thus, Tapphorn does <u>not</u> disclose or suggest depositing a metal substrate of a cation in-situ on a substrate and reacting the metal substrate of the cation to form a primary explosive layer.

Finally, for emphasis, Applicant's inventive method, and related structure, is structurally <u>distinct</u> from the Tapphorn invention as Applicant's invention is configured to make a thin film explosive detonator, which <u>removes</u> the necessity for synthesis, handling, loading, transportation and storage of bulk quantities of sensitive primary

explosive materials, for example, see new claim 20. The Tapphorn invention, <u>however,</u> is a conventional method, which reduces the yield strength during impact of particles and thus permits plastic deformation at low flow stress levels and may be used to inject a pyrophoric material in a metal matrix.

Based on the above, Applicant traverses the assertion that Tapphorn discloses or teaches Applicant's invention of independent claim 1, and related dependent claims 2-5.

For at least the reasons outlined above, Applicant submits that Tapphorn, alone or in combination, does not disclose, teach or suggest, including <u>depositing a metal layer of a cation in situ on the substrate layer</u> as recited in independent claim 1.

<u>B. The Rejection Based on Tapphorn in view of Garvick</u>

Regarding independent claim 1, and related dependent claims 6 and 7, to make up for the deficiencies of Tapphorn, the Examiner relies on Garvick. First, the references, separately or in combination, fail to disclose, teach or suggest a reason or motivation to be combined.

Nothing within Garvick, which pertains to MEMS slapper/explosive foil initiator detonator with an arming slider barrier for <u>preventing premature detonation</u> at any time after the safety barrier is removed, suggests a system for solid-state deposition and consolidation of high velocity powder particles onto a surface of an object to <u>reduce</u> the yield strength during impact and thus permit plastic deformation at low flow stress levels as disclosed in Tapphorn. Thus, Tapphorn <u>teaches away</u> from being combined with another invention, such as, Garvick. (Garvick at Abstract; and Column 2, lines 8-25).

Therefore, one of ordinary skill in the art would not have combined these references

absent hindsight.

Second, even assuming that the references would have been combined, Tapphorn, as indicated above, does not disclose, teach or suggest the features of independent claim 1, and related dependent claims 6 and 7, including depositing a metal layer of a cation in situ on the substrate layer. (See above).

Indeed, Applicant agrees with the Office Action that Tapphorn does not disclose or teach the features of claims 6 and 7, including depositing an organic flyer layer on top of the primary explosive layer or forming a barrel in the substrate layer. (See Office Action, Page 3, Section 5).

Garvick is also deficient.

Instead, Figures 1A-3B of Garvick merely disclose, as discussed above, a MEMS slapper/explosive foil initiator detonator with an arming slider barrier for preventing premature detonation at any time after the safety barrier is removed. The MEMS slapper includes, in part, an explodable foil 10, a flyer plate 20, a safety and arming barrel plate 30 and a high explosive pellet 40. The barrel plate 30 includes a slidable barier 32, which may be in a safety position to close a barrel plate 30. The slidable barrier 32 may be in an arming position, for example in Figure 1B, to the open barrel 40. Accordingly, this MEMS structure is configured to prevent premature detonation. (See Garvick, Column 3, liens 10-35; and Figures 1A-3B).

Importantly, Garvick's MEMs structure does not disclose or suggest a process for making a thin film explosive detonator, let alone, in part, depositing a metal layer of a cation in situ on a substrate layer, let alone, reacting the metal layer to form a primary explosive layer as claimed by Applicant. Therefore, Garvick does not disclose, teach or

suggest, including <u>depositing a metal layer of a cation in situ on the substrate layer</u> as claimed by Applicant. (See above).

For at least the reasons outlined above, Applicants submit that neither Tapphorn nor Garvick, alone or in combination, disclose, teach or suggest, including <u>depositing a metal layer of a cation in situ on the substrate layer</u> as recited in independent claim 1.

For the reasons stated above, the claimed invention, and the invention as cited in independent claim 1, and related dependent claims 6 and 7, is fully patentable over the cited references.

II. Formal Matters and Conclusions

In view of the foregoing, Applicants submit that claims 1- 7 and 17-20, all the claims presently pending in the application, are patentably distinct from the prior art of record and are in condition for allowance. The Examiner is respectfully requested to pass the above application to issue at the earliest possible time.

Should the Examiner find the application to be other than in condition for allowance, the Examiner is requested to contact the undersigned at the local telephone number listed below to discuss any other changes deemed necessary.

RECEIVED
CENTRAL FAX CENTER
SEP 2 0 2006

Please charge any deficiencies and credit any overpayment to Attorney's Deposit Account Number 50-1114.

Respectfully submitted,

Dated: 20 Sept. 2006

Fredric J. Zimmerman
Registration No. 48, 747

Office of Counsel Code OC-A
Naval Surface Warfare Center
Indian Head Division
101 Strauss Ave., Bldg. D-31
Indian Head, MD 20640-5035
(301) 744-5603